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INTERCONNECT
INDUSTRY REVIEW

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SCOPE AND METHODOLOGY

This report is the first annual study of the interconnect industry by the North American Telecommunications Association. The study provides an overview of various aspects of the interconnect industry including revenue, installed base, expenses, and employment. These findings come from the best data available and are grounded in assumptions reflecting trends and developments as reported by a wide range of industry sources.

The data contained in this study was compiled from primary and secondary sources. The Market Research Department conducted an extensive, formal survey of interconnect companies (mainly NATA members) and extrapolated those results to the industry as a whole. Approximately 750 questionnaires were mailed. Data was obtained for about 125 of those companies. In addition, the Market Research Department reviewed other industry studies and appropriate trade journals and consulted many independent analysts to ensure that no significant trends have been overlooked. Except where noted, the data and assumptions in this report are entirely those of NATA.

Although this report represents the best efforts of the Market Research Department at preparing useful and timely information on the interconnect industry, NATA specifically does not guarantee the accuracy of the data. NATA staff are available to answer any questions concerning the statistics presented herein by calling 1-800-LET-NATA.

Eric Nelson
Director, Market Research
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THE YEAR IN REVIEW

By Edwin B. Spievak

This year, 1988, marks the 20th anniversary of the Carterfone decision, and the birth of the interconnect industry. We commemorate the daring entrepreneurs that shaped the telecommunications industry into a truly competitive marketplace where more opportunities are available to more companies and where consumers are offered a myriad of products and services that make communications more efficient, advanced and manageable.

While the industry has grown from a handful of companies in 1968 to over 10,000 interconnects in 1988, the industry is going through a transitional period. Competition is keener that it ever has been. Profit margins on mainstay products like key systems and PBXs are slim and narrowing. Combine that with successes that the Regional Bell Operating Companies (RBOCs) are having in CPE sales as well as Centrex revitalization and its apparent that interconnects need to pursue aggressive and creative marketing efforts to remain profitable.

As part of the transition, the ongoing trend of mergers and acquisitions continued to change the structure of the industry. This has given many companies the necessary resources to expand into profitable product areas. While mature markets witnessed sluggish demand and diminishing profit margins, nascent markets exploded and margins were covetous. The integration of computer and telecommunications technology accelerated and provided good sales opportunities for interconnects. Industry leaders found that attention to superior customer service and broadening product offerings to include data equipment, voice peripherals, and telecom services offered the key to survival.

Public policy developments in the past year concerning interconnect companies have produced mixed results in terms of NATA's long standing efforts to ensure a procompetitive playing field. The MFJ court completed its first triennial review, keeping many of the significant safeguards intact. However, the RBOCs were allowed to begin offering "gateway" services and voice messaging services. These will likely have far-reaching consequences on those industries.

Congress also has been active in telecommunications issues this year. A nonbinding resolution to "Free the Bells" was introduced. Although the resolution would not have any effect as law, it could set the stage for a move back in time to an anticompetitive, vertically integrated, monopolistic marketplace. NATA objected strenuously to the resolution which, by Congressional recess had picked up significant support in the House and had only just been introduced in the Senate.

Actions at the FCC have been somewhat more favorable. The Commission pursued the enforcement of the sales agency program, ensuring that nontelcos have the same marketing capabilities as telcos and receive commissions for their sales of network services. In the area of customer proprietary network information, the Commission sided with NATA. Other procompetitive efforts included decisions on comparably efficient interconnection and open network architecture.

The past year has been exciting, exasperating, explosive and anemic. Some interconnect companies have done extremely well, others barely survived, and others didn't make it. Overall though, it remains a good business. Telecommunications is one of the most critical aspects of conducting business. More efficient telecommunications systems mean better business efficiency, which means better margins. The interconnect company that can creatively market a solution to a customer's business telecommunications needs will, like the producer of the proverbial better mousetrap, "have the world beating a path to its door."

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BACKGROUND

BACKGROUND

The interconnect industry was born in 1968, with the FCC's Carterfone decision which struck down AT&T's prohibition of interconnection to the telephone network. While this was a landmark date, that event did not occur in isolation. Many events led up to the Carterfone decision (see Chronology in Appendix A). Efforts to diffuse or at least regulate AT&T's monopoly position began in the 1910's when antitrust feelings were strong and the successful prosecution of Standard Oil and American Tobacco (both in 1911) proved that the Sherman Act could be used to break up monopoly power. Rather than risk dissolution, AT&T decided to embrace regulation. The Willis-Graham Act of 1921, in exchange for regulatory review, sanctioned the contemporary position of AT&T, i.e., that of monopoly provider of long-distance service, vertical integration in manufacturing, and the monopoly position of the local telephone companies.

With the Communications Act of 1934, which created the Federal Communications Commission, regulation was set in place, competitive entry was foreclosed, and until 1949, the telecommunications industry was secure for AT&T. In 1949 the Justice Department filed an antitrust suit against AT&T with the primary objective of separating communications equipment from service. The case was finally settled in 1956. The consent decree provided for the continuation of the vertical integration of AT&T, but precluded AT&T from manufacturing products for any customers other than the Bell Operating Companies. In addition, AT&T was forced to indiscriminately grant licenses to all past and future patents. Of significance was the 1948-patented transistor. This single product (along with its more recent derivatives of integrated circuits and other semiconductor devices) has revolutionized computers, telecommunications products, and related industries.

The year 1956 also witnessed the FCC's Hush-a-Phone decision which allowed for the attachment of a sound-muffling coupler, not manufactured by AT&T, to a telephone handset, the purpose of which was to provide a more secure and quiet conversation in a noisy environment. This decision was the precedent for the FCC's Carterfone decision of 1968. Specifically, the Carterfone was a device that acoustically and inductively connected mobile car radios to the national telephone network. In the Carterfone decision, the FCC found that a subscriber's right to use the network in ways that are, "privately beneficial without being publicly detrimental" extended to all types of equipment, including telephone terminal equipment.

Other legal, legislative, and regulatory events have impacted greatly on the interconnect industry since then. Most of these decisions have had the effect of insuring competition in the provision of telecommunications equipment to the end user. Some of the most important regulatory decisions include the FCC Part 68 Registration Program of 1977 which allowed direct connection to the telephone network without telco approval, provided that the

instrument to be attached is registered with the FCC and certified not to be harmful to the network. Another important decision, the FCC Computer II ruling of 1980 provided a framework to ensure the transition to open and competitive equipment and enhanced-services market. Also very important was the 1982 Consent Decree which established the guidelines for the 1984 divestiture of AT&T. The 1984 FCC Sales Agency ruling set the stage for the possible resale of network services by nontelcos. Most recently, the MFJ court conducted a triennial review of the divestiture and left in place most of the procompetitive safeguards.

SUMMARY

SUMMARY

Currently, the interconnect industry is enduring a period of consolidation and retrenchment as its players respond to changing market conditions. Events of 1986 and 1987 point to a long-term shift in distribution. Manufacturers appear to be shifting distribution away from wholesalers and independent vendors towards their own direct sales. The purchase of Tel-Plus by Siemens, the purchase of Jarvis by Isoetec, the purchase by TIE of numerous interconnects, and the interest taken in AIM by NEC--all of which occurred in 1987 and 1988--are but a few examples of the trend that is expected to continue over the next several years. In addition, Regional Bell Operating Companies (RBOCs) have begun to purchase interconnect companies to have a ready distribution channel for sales of CPE.

These trends, combined with mergers between the interconnects themselves, are leading to a decreasing number of interconnects. The tremendous influx of new vendors into the market in 1983 and 1984 was turned into an exodus in 1985 and 1986 because of business failures and acquisitions. The shakeout of marginal companies is expected to continue in the near term, making the vendor market much more concentrated by the end of the decade. The trend will lead to less intense price competition than that which has plagued the industry since 1984. Individual interconnect vendors who remain in the market will have increased bargaining power with their suppliers as the pool of independent dealers shrinks.

Interconnect companies are beginning to improve their profitability by selling peripheral equipment. The most popular peripherals that interconnects sold in 1987 were call accounting systems, voice messaging equipment, and automatic call distributors (ACDs). Since these products are either new, filling pent-up demand or niche products, they command higher mark-ups than mature, ubiquitous products like key systems and PBXs. In addition, interconnects are increasingly becoming sales agents for telephone companies and selling network services to round out their product offerings to business customers. CPE sold in conjunction with Centrex is also becoming a niche product that is increasingly appealing to interconnects.

Other trends in the interconnect industry include decreasing employment, coupled with increasing employee productivity. The secondary (used) equipment market is becoming increasingly appealing to some interconnects, as is reselling long-distance telecommunications service. In general, interconnects are considered more and more to be system integrators. As such, they are increasing the range of products and services they have to offer and they are showing that total service and one-stop-shopping is the key to profitability in the interconnect industry.

INDUSTRY STRUCTURE

INDUSTRY STRUCTURE

The independent interconnect industry, which is the industry that buys business telecommunications equipment from manufacturers or other suppliers, and sells and installs that equipment, is large and diverse. Including branch offices, there are over 10,000 interconnects in the United States; however, some 1,000 to 1,500 individual companies account for the vast majority of the industry. These companies range in size from very large, multi-state companies such as Centel Business Systems with 110 offices employing some 2,600 persons and having sales of $275 million in 1987 to small, operations with sales in the tens of thousands of dollars range.

The industry is undergoing significant consolidation through mergers and acquisition. Mergers between interconnects are occurring to enhance buying power with manufacturers, to pool resources, and to give the customer the perception of stability, longevity, and growth. With RBOCs getting in the business, and interconnects having to compete with their image as being solid and eternal, interconnects are feeling that it is important to enhance their own image in that area.

In addition to mergers between interconnects, manufacturers are buying independent interconnect companies for exclusive distribution of their products. In a market as competitive as the business telecommunications equipment market, this has been one method that manufacturers have used to ensure a stable distribution of their products. Another parallel trend has been the purchase of interconnect companies by Regional Bell Operating Companies (RBOCs). RBOCs have wanted to be full service companies, able to provide not only telecommunications service, but equipment as well. Buying an interconnect gives an RBOC that ability immediately. As examples of the "Pacman" syndrome in the interconnect industry, in the first nine months of 1988, TIE, one of the most active manufacturers in recent years, bought four interconnect companies and Pacific Telesis, one of the RBOCs, also bought an interconnect.

INTERCONNECT REVENUE

INTERCONNECT INDUSTRY REVENUE

Total revenues of the interconnect industry increased from an estimated $2.2 billion in 1986 to $2.6 billion in 1987 (see Table 1). Revenues are expected to increase throughout the remainder of the decade and amount to some $3.5 billion by 1990. While the interconnect business is growing, it is only growing because it is changing. The composition of the sources of revenue is shifting away from the sale of mainstay products like PBXs and key/hybrid systems to other products that are new and exciting and/or fill a niche market. Aggressive and creative marketing is being required to stay profitable.

Revenues from the sale of new systems (PBX and key/hybrid systems) increased from $1.1 billion in 1986 to $1.2 billion in 1987 and is expected to increase to $1.3 billion by 1990. While still the largest source of revenue for the industry, as a share of the total, revenue from the sale of new systems decreased from 50 percent in 1986 to 46 percent in 1987, and is expected to decrease even further to 37 percent by 1990 (see Figure 1). A breakdown of the value components of a typical PBX sale is presented in Appendix B.

Revenue from adds, moves and changes represented the second largest source of revenue for the interconnect industry during 1986-87. Such revenue increased from $624 million in 1986 to $765 million in 1987. For the remainder of the decade, revenue from this source is expected to increase steadily and amount to $825 million by 1990. Revenue from service contracts is another increasingly important source of income for the industry; with revenue from that source growing 10 percent from $200 million in 1986 to $220 million in 1987, and with expected revenues of $270 by 1990.

The fastest growing source of revenue for the interconnect industry is in the "other" category. This revenue is generated principally from sales of peripheral equipment and services. Increasingly, sales of these products and services are the most profitable of the interconnects' offerings. This is related not only to the higher margins per product, but also to the ability to feed off an existing customer base for sales of these peripheral products and services. Rapid growth in the markets for these products is offsetting the stagnant growth in PBXs and key systems. The most popular peripheral sold in 1987 was call accounting, with some 64 percent of all interconnects selling some type of call accounting system (see Table 2 and Figure 2). The next most popularly sold add-on with 55 percent of all interconnects, was voice messaging systems. Automatic call distributors (ACDs) were next, with 46 percent of interconnects selling them.

Table 3 and Figure 2 show the manufacturers market shares of combined sales of new PBX and key systems by interconnect companies in 1987. As shown, the market is fairly well distributed among the top 18 companies, all of which have over 1 percent market share. Only 3 companies, Rolm, Toshiba, and NEC have over 10 percent.

Table 1. Interconnect Revenue, by Source, 1986-90

(millions of dollars)

Source	1986	1987	1988(e)	1990(e)
New Systems	$1,144	$1,196	$1,225	$1,300
Adds/Moves/ Changes	624	765	790	825
Service Contracts	200	220	260	270
Other	312	411	755	1,105
Total	$2,280	$2,592	$3,030	$3,500

Source: NATA Market Research Department

Table 2. Popular Add-On Equipment

Equipment/Service	Percent Selling
Call Accounting Systems	64
Voice Messaging Systems	55
ACDs	46
Data Communications Equipment	38
Facsimile Terminals	35
Centrex Service	33
Electronic Mail/ Databases	25
Cellular	15

Source: NATA Market Research Department

Table 3. Manufacturers' Market Shares of Interconnect Sales, 1987

Manufacturer	Market Share
Rolm	15
Toshiba	13
NEC	12
TIE	9
Isoetec/Vodavi	8
ITT/Alcatel	7
Hitachi	5
Northern Telecom	5
Executone	5
Siemens	4
Inter-Tel	3
Telrad	3
Panasonic	2
Comdial	1
Ericsson	1
Fujitsu	1
Harris	1
Others	5

Source: NATA Market Research Department

Figure 1

Interconnect Revenue, by Source, 1986-90

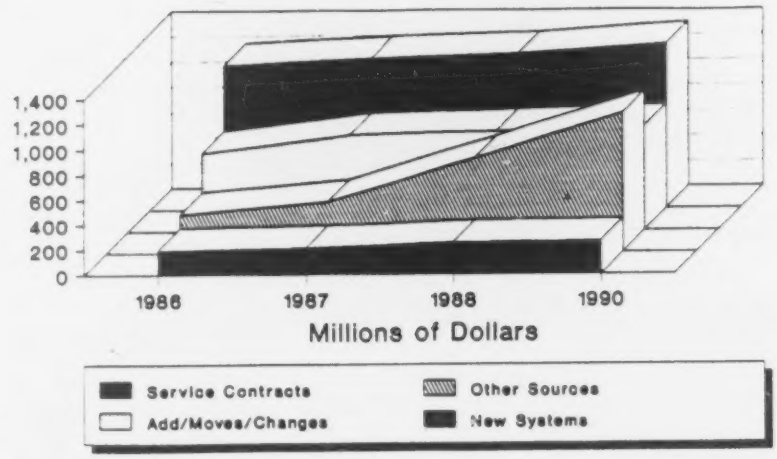


Figure 2

Popular Peripheral Equipment

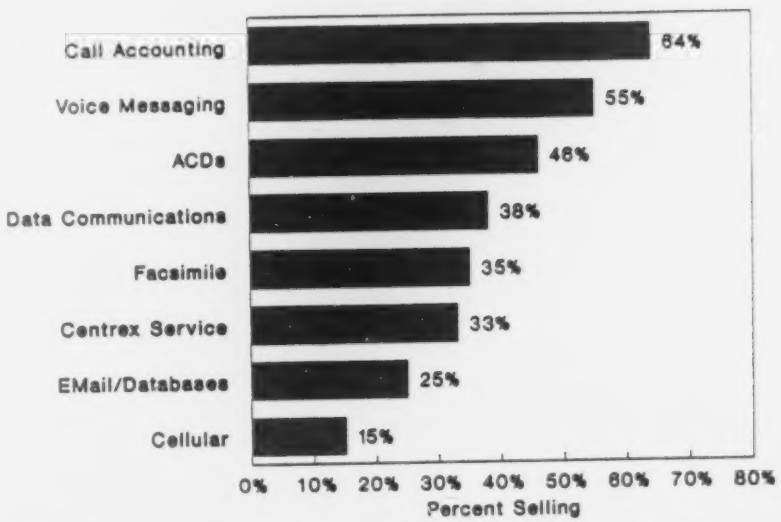
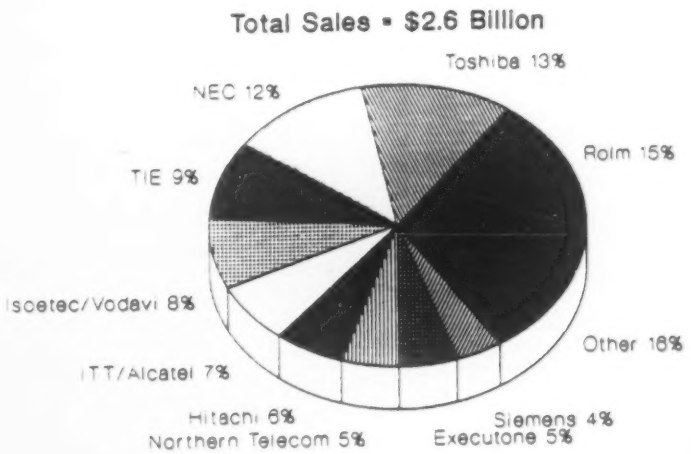


Figure 3

Manufacturers' Market Shares Of Interconnect Sales, 1987



INSTALLED BASE

INSTALLED BASE

Interconnect companies' share of the total installed base of PBX lines amounted to an estimated 47 percent in 1987, while RBOCs had approximately 7 percent. Independent telcos and manufacturer-owned interconnects controlled the balance. The market is projected to change somewhat through the rest of the decade with interconnects losing some market share, RBOCs and manufacturer-owned interconnects picking up some market share, and independent telcos' market shares remaining relatively constant.

The dynamics of the installed base of key systems is slightly different. Interconnects had about 36 percent of the total installed base of key/hybrid systems in 1987. That is expected to remain stable or perhaps even increase somewhat depending on the extent, to which interconnects are successful at selling key systems in conjunction with Centrex services. RBOCs market share should increase somewhat from about 6 percent in 1987 to about 10 percent by the end of the decade.

The installed base of PBX systems for independent interconnect companies increased from 9.4 million lines in 1986 to 10.5 million in 1987 and expected to increase slowly to 11.8 million by 1990 (see Table 4). For key systems, the installed base of interconnect companies increased from 5.4 million in 1986 to 5.7 million in 1987. As a percent of the total lines installed, key systems decreased from 36 percent in 1986 to 35 percent in 1987, and is expected to decrease further to 34 percent by 1990 (see Figure 4).

Table 4. Interconnect Installed Base of Lines For PBX and Key Systems, 1986-90

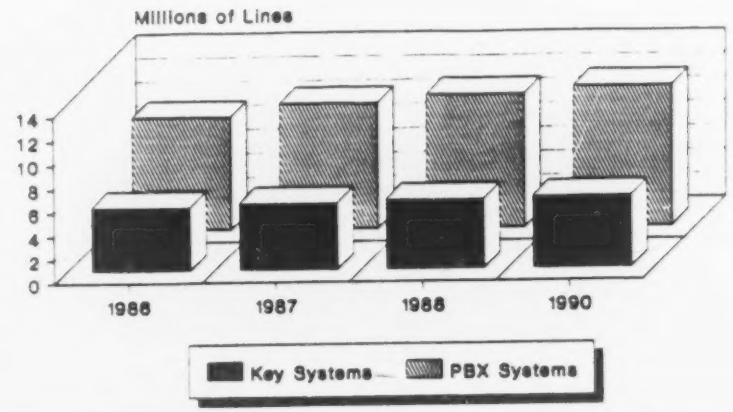
millions of lines

System	1986	1987	1988(e)	1990(e)
PBX Systems	9.4	10.5	11.2	11.8
Key Systems	5.4	5.7	5.9	6.1
Total	14.8	16.2	17.1	17.9

Source: NATA Market Research Department

Figure 4

Interconnect Installed Base of Lines for PBX and Key Systems, 1986-90

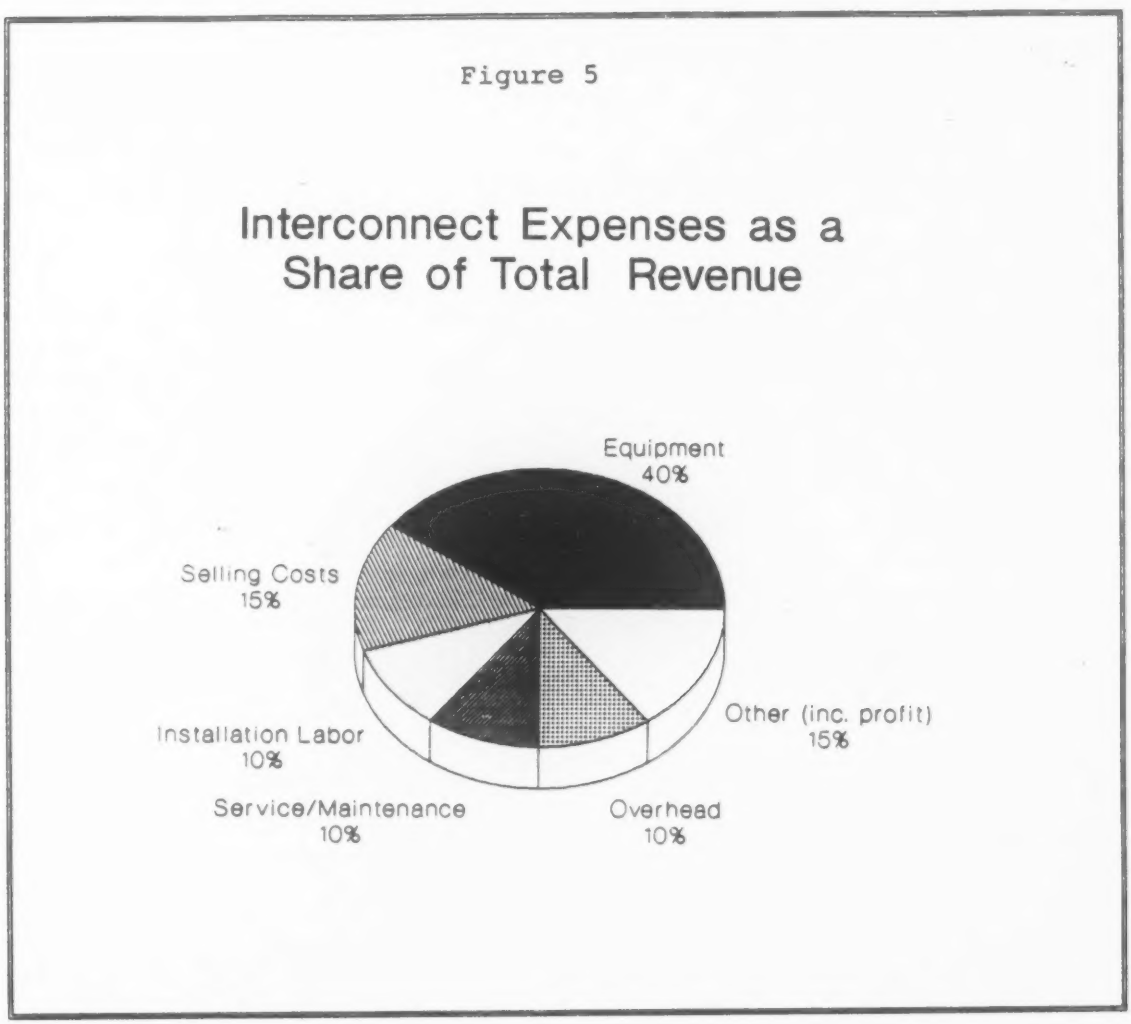


INTERCONNECT EXPENSES

INTERCONNECT EXPENSES

On average, interconnect companies spend approximately 40 percent of total revenue on equipment (see Fig 5). Selling costs; which include commissions, wages, and advertising represent about 15 percent of total revenue. Labor costs associated with installation average almost 10 percent of revenue, while costs associated with service/maintenance and overhead costs, each also represent about 10 percent of revenue. The balance of total revenue of 15 percent is accounted for by other costs and earnings.

Figure 5



Considering just the breakdown of total expenses, on average, interconnect companies spend approximately 48 percent of their expense budget on equipment and materials (see Table 5). The next largest expense item, at 15 percent of the total, is the labor cost involved in the installation of the systems (see Figure 6). Other large expense-budget items include overhead (12 percent), selling costs (11 percent), and service/ maintenance costs (10 percent).

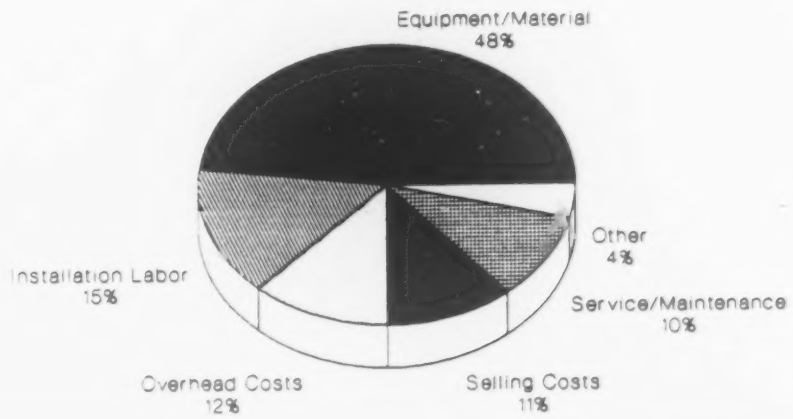
Table 5. Allocation of Interconnect Expenses, 1987

Wholesale Equipment and Material	48%
Labor (Installation Costs)	15%
Overhead Costs	12%
Selling Costs (Commissions, Wages, and Advertising)	11%
Service/Maintenance Costs	10%
Other	4%
Total	100%

Source: NATA Market Research Department

Figure 6

Allocation of Interconnect Expenses, 1987



INTERCONNECT
STAFFING

INTERCONNECT STAFFING

Employment.--Total employment in the interconnect industry decreased from an estimated 28.4 thousand to 26.3 thousand in 1987, with expectations of a slight increase in 1988, to 26.4 thousand and a further slight increase to 27.0 thousand by 1990 (see Table 6 and Figure 7). The decrease in employment from 1986 to 1987 is a function of a contraction in the industry due to mergers and acquisitions. This trend will tend to keep total employment rather stable throughout the rest of the decade although there will be strong demand for certain types of employees. According to industry sources there is a shortage developing of qualified career-oriented employees in sales and customer service.

Installation/Maintenance employees make up the largest segment of the total. Employment of persons in this category decreased from 16.9 thousand in 1986 to 16.0 thousand in 1987 and is expected to decrease slightly in 1988 to 15.9 thousand. As the systems become more diverse and complex, employment in this area should increase some the last couple of years of the decade, and amount to 16.3 thousand in 1990.

Employment of marketing personnel was stable at 5.0 thousand in 1986 and 1987. A slight increase is expected in 1988 to 5.1 thousand. Despite a downward trend in employment of other types of employees, employment of marketing personnel should remain stable through 1990. As the number of systems and features proliferate, marketing efforts are becoming more important in helping to differentiate one company's product offerings from another.

Employment of sales personnel decreased from 4.7 thousand in 1986 to 3.7 thousand in 1987 with increases expected throughout the rest of the decade to 4.0 thousand in 1990. The reason for the slump in 1987 is related to increasing productivity of sales employees. Sales of new telephone systems (to new customers), which is the most difficult type of sale, is making up increasingly less of an interconnect's total revenue, while adds, moves, and changes; and sales of add-ons and peripherals are accounting for increasingly more of an interconnect's revenue. Despite the opportunities, there is a shortage developing for qualified sales personnel, as mentioned above.

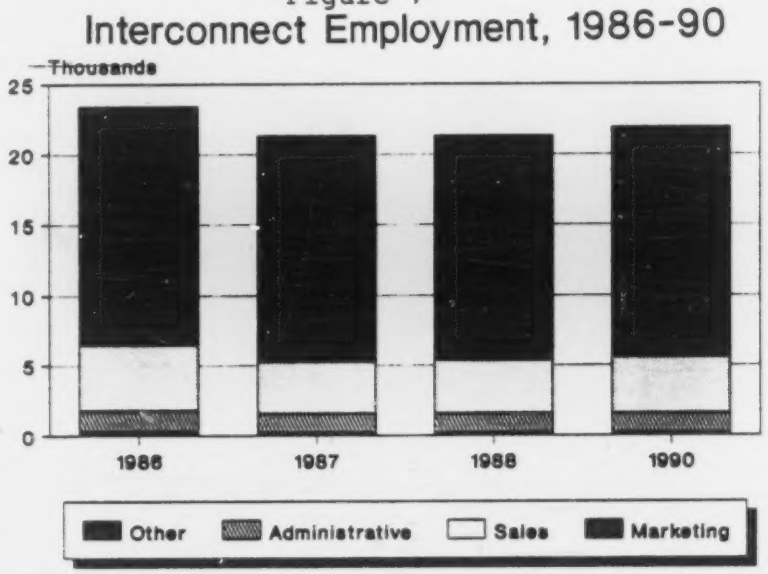
Table 6. Interconnect Employment, 1986-90

(thousands)

Employee Type	1986	1987	1988(e)	1990(e)
Sales	4.7	3.7	3.8	4.0
Installation/ Maintenance	16.9	16.0	15.9	16.3
Marketing	5.0	5.0	5.1	5.1
Administrative	1.4	1.3	1.3	1.3
Other	.4	.3	.3	.3
Total	28.4	26.3	26.4	27.0

Source: NATA Market Research Department

Figure 7



Productivity.--Average productivity of total employees, i.e., total revenue divided by total employment, increased from slightly more than $80,000 in 1986 to over $98,000 in 1987. The trend is expected to continue through the end of the decade when employee productivity is expected to exceed $125,000. This trend is explained by increasing office automation, coupled with easier maintenance of installed base equipment and the ability to feed off of an existing customer base for sales of new peripherals.

Individual productivity of sales personnel and installation/maintenance personnel in the interconnect industry has been on the rise in recent years. Revenue per salesperson has increased from $442.6 thousand in 1986 to $520.0 thousand in 1987 (see Table 7). This is expected to increase to $692.1 thousand in 1988, before stabilizing and even decreasing slightly to $690.0 thousand by 1990. The reason for the increase in productivity, as mentioned above, is the fact that new systems are accounting for increasingly less of an interconnect's business, while adds, moves and changes; and sales of system add-ons are becoming more important. It is easier to sell additional lines and add-on equipment to an existing customer base than it is to sign up new customers for sales of new systems. Thus, each individual salesperson can sell more. This trend will stabilize somewhat in the next few years as the markets for many of the add-ons become more mature.

Productivity of installation/maintenance personnel has also been increasing from 875 lines per person in 1986 to 1,013 lines per person in 1987, and is expected to increase to about 1,100 lines per person by 1990. The reason for the trend of increasing productivity of these types of employees is related to the equipment itself. With many newer products having self diagnostics characteristics and modular design, it becomes easier and faster to install and maintain many of the systems.

Table 7. Interconnect Employee Productivity, 1986-90

	1986	1987	1988(e)	1990(e)
Revenue per Salesperson ($1,000)	442.6	520.0	692.1	690.0
Lines per Installation/Maintenance Person.....	875	1,013	1,075	1,098

Source: NATA Market Research Department

Executive Salaries 1/.--As shown in Table 8, in 1987, a President or CEO of an interconnect company earned an average of $89,000 per year. A Vice President made an average of $58,000, while a sales manager made an average of $40,000. These figures do not include bonus or fringe benefits, such as vacation homes, automobiles, etc.

Table 8. Interconnect Executive Salaries

Position	Annual Salary
President/CEO	$89,000
Vice President	$58,000
Sales Manager	$40,000

Source: NATA Market Research Department

1/ A separate study by the North American Telecommunications Association on compensation and benefits practices for technical/engineering and sales personnel for the interconnect industry will be released in the first quarter of 1989.

APPENDIX A
CHRONOLOGY OF EVENTS

Chronology

1921-Willis Graham Act-Sanctioned the vertical integration of AT&T

1934-Communications Act of 1934-Created the FCC and formally entrenched the regulation and monopoly position of AT&T

1956-Consent Decree-Provided for continuation of the vertical integration of AT&T, but foreclosed the opportunity for AT&T to manufacture any other products except those used by the Bell System for telephone service. In addition, AT&T was forced to indiscriminently license the company's recently invented transistor, predecessor of the semiconductor which has ushered in the computer age.

1956-Hush-a-Phone-Court decision which allowed customers to attach non-AT&T manufactured acoustic devices to AT&T telephones, provided they presented no risk of harm to the public network.

1968-Carterfone-Landmark FCC ruling allowing customers to purchase and attach all types of telephone equipment to the public network as long as it was not technically harmful to the network.

1970--Establishment of the North American Telephone Association--NATA was established by daring entrepreneurs to fight to open the telephone industry to competition.

1974-Telerent-An FCC decision which overruled the North Carolina PUCs decision to prohibit non-AT&T CPE, unless it was used solely for interstate communications. This decision effectively insured that the states could not adopt network attachment guidelines that would be more stringent than those adopted by the FCC.

1976-Mebane Home Telephone Court Decision-Prohibited telcos from infringing upon customer' interconnection of equipment merely because it could be defined as constituting "a substitution for telephone system equipment."

1977-FCC Part 68 Registration Program-Allowed direct interconnection to the public telephone network of telephone equipment that has previously been registered and certified by the FCC not to be harmful to the network. It obviated customers investing in costly protective couplers.

1978-Primary Instrument Ruling-An FCC ruling which overturned an AT&T requirement that at least one telephone per household had to be supplied by the telephone company.

1980-Computer II-FCC ruling that provided a framework to ensure the transition to open and competitive equipment and enhanced-services markets. A sharp distinction was made between basic transmission services and non-basic or "enhanced services." Basic

service would continue to be offered under regulation while enhanced services and CPE could be offered only on a deregulated, competitive basis. AT&T and the BOCs could offer unregulated products and services only through fully separate subsidiaries.

1980--Central Operations Groups Requirement (Jarvis antitrust settlement)-Decision out of which emerged the FCC requirement that all Bell Operating Companies (BOCs) establish a central source for information and assistance regarding network interconnection, thereby ensuring nondiscriminatory service and network access for vendors and their customers.

1982-Consent Decree-The 1982 Consent Decree provided for the divestiture by AT&T (effective January 1, 1984) of its Regional Bell Operating Companies (RBOCs). AT&T was to consist of its manufacturing arm, Western Electric (now AT&T Technologies), and its long distance telephone company, AT&T Long Lines (now AT&T Communications). The RBOCs would offer local telephone service and would not be allowed to provide long distance communications, enter manufacturing, or provide information services.

1983-Inside Wire Decision-An FCC decision mandating telephone companies to deregulate inside wiring on a customer's premises--wire inside the network interface. The FCC ruling greatly reduced the telco's opportunity to leverage their control of wiring to undercut interconnects' equipment and cabling business.

1983-Separate Subsidiaries-A ruling by the FCC that the spun-off RBOCs would be subject to the same separate subsidiary requirement as AT&T for marketing CPE and enhanced services.

1984-Sales Agency-FCC ruling required that all RBOCs wanting relief from Computer II requirements for marketing equipment through separate subsidiaries establish Sales Agency programs that involve significant independent vendor participation. Sales Agency enabled independent vendors as well as RBOC CPE marketers, to sell centrex and other network services along with CPE.

1986-Computer III-An FCC decision allowing AT&T and the RBOCs to drop the separate subsidiary requirement for the marketing of CPE and enhanced services, but required them to retain COGs and Sales Agency programs among other non-structural safeguards, such as following specific accounting guidelines to ensure against cross subsidization.

1987-Triennial Review of the Divestiture Decision-A Court ruling which left in place many of the safeguards to competition that were included in the 1982 Consent Decree, most notably the prohibitions against the RBOCs entry into manufacturing and long distance communications.

APPENDIX B
TYPICAL COMPONENTS OF A PBX SALE

Value Components of a Typical PBX Sale

Switch Price to Buyer	60%
Installation	5%
Station Equipment	10%
Station Installation	12%
Battery	2%
Five-Year Service Contract	11%

Source: The Huber Report

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